**managing MOOD DISORDERS in patients attending pulmonary rehabilitation CLINICS**

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**Running header (shortened title): Mood disorders and COPD**

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### ABSTRACT

**Background:** There is good evidence for the positive benefits of pulmonary rehabilitation (PR) in prevention of hospital admissions, lower mortality and improved health-related quality of life.There is also increasing evidence about the impact of PR on mental health and in particular mood disorders. We aimed to identify how depression in COPD patients in Victoria is being managed in PR, to identify the prevalence of depressive symptoms among COPD patients who attend PR and to determine whether patients with depressive symptoms or anxiety symptoms dropped out of PR early.

**Method:** Of 61 PR clinics, 44 were invited and 22 agreed to participate. Telephone interviews were conducted to see how depression and anxiety in COPD patients was being recognized and managed in these clinics. A total of 294 questionnaires were distributed to patients by clinic coordinators to determine the prevalence of anxiety/depression as measured by the Hospital Anxiety and Depression Scale. Coordinators were contacted to provide information on whether respondents dropped out of rehabilitation early, or continued with their treatment at two to four months post program.

**Results:** Seven clinics were not aware of local guidelines on assessment/treatment/management of mood. Four clinics did not use any screening tools or other aids in the recognition and management of depression and/or anxiety. Overall, eight clinics participating in this study requested advice on suitable screening tools. The patient survey indicated that the mean depression score on the Hospital Anxiety and Depression Scale was 5.0 (SD 3.0, range 1-13). The mean anxiety score was 5.5 (SD=3.4, range 0-18). There was no evidence of a link between failure to complete rehabilitation and depression or anxiety scores as only 3/105 patients failed to complete their rehabilitation.

**Discussion:** Awareness of management guidelines for depression and anxiety in COPD patients was variable across the clinics recruited into our study. We found no link between compliance with rehabilitation and depression but our sample had limitations.

**Conclusion:** Future research needs to investigate how best to encourage more use of available guidelines regarding integrating psychological and psychosocial support to supplement the exercise and education that is currently offered routinely by all PR clinics studied in Victoria, Australia.

**3-6 keywords:** Chronic obstructive pulmonary disease, depression, anxiety, pulmonary rehabilitation

**Abstract word count:** 300 words

**Manuscript word count:** 2,819

### Background

The importance of pulmonary rehabilitation (PR) in the management of chronic obstructive pulmonary disease (COPD) is now well recognised1. There is good evidence for the positive benefits of PR in the prevention of hospital admissions, lower mortality and improved health-related quality of life.1 There is also increasing evidence for a positive impact of PR on mood disorders such as depression and anxiety which are common co-morbidities of COPD2. The published prevalence rates for depression in COPD patients vary widely,4-10 but some estimates of depression in COPD patients are around 50%11 or, for severe COPD, approximately 2.5 times greater than in an age-matched control population,12 and significant depression symptoms have been reported in 16-74% of patients with COPD.5, 10, 13-15 Studies employing the Hospital Anxiety and Depression Scale (HADS) found estimates of prevalence ranging from 2-47%.5-9, 16, 17 Undiagnosed and untreated depression in patients with COPD is associated with non-compliance with medical treatment and reduced quality of life.18 Compared with non-depressed patients, the odds are three times greater that depressed patients will be noncompliant with medical treatment recommendations.18 Nevertheless, in Australia, mental disorder co-morbidity has been grossly under-recognised in patients with COPD.19

Internationally, there are well-established clinical guidelines for the treatment of depression and anxiety associated with COPD in the United Kingdom.20  According to the British guidelines, the presence of anxiety and depression should be considered in patients who are hypoxic (SaO2 less than 92%), who have severe dyspnoea, and who have been seen at or admitted to a hospital with an exacerbation of COPD. The guidance recommends that patients found to be depressed or anxious be treated with conventional pharmacotherapy, and for those undergoing antidepressant treatment, that time is spent with the patient explaining why depression needs to be treated. Optimal care for COPD patients may require combining pharmacologic with non-pharmacologic therapies. Pharmacologic treatment of depression in COPD patients may be less tolerated than non-pharmacologic treatments due to side effects such as sedation, which may cause respiratory depression and aggravate sleep disturbances. 21 Non-pharmacologic therapies include smoking cessation and encouragement of physical activity, education, collaborating on self-management plans and cognitive behavior therapy (CBT).2, 23 In Australia we have COPD guidelines which are a joint publication from the Australian Lung Foundation and the Thoracic Society of Australia and New Zealand21,22 . The Australian guidelines summarise international evidence for pharmacological treatments but also summarise the evidence for treatments for anxiety and depression. The guidelines include recommendations for referrals to psychologists and psychological supports, the use of patient support groups for psychosocial supports, and screening for anxiety and depression symptoms using standardised screening scales such as the Hospital Anxiety and Depression Scale22.

### Rationale

This project focused on what systems are available for the recognition of depression and anxiety at Victorian PR clinics. We aimed to identify how depression and anxiety in COPD patients are being managed in PR, awareness of management guidelines, and to identify the prevalence of depressive symptoms among COPD patients who attend PR in Victoria. While the relationship between anxiety, depression and adherence to PR has been examined in other studies (Garrod et al, 2006; Harrison et al, 2012), there have been no studies of the impact of anxiety and depression on adherence to PR as it is practised in Victoria or on the relationship between awareness of COPD management guidelines and mood disorders in PR patients. Specifically, we asked the following research questions:

1. How are depression and anxiety in COPD patients recognized and managed in PR clinics in Victoria?
2. What is the prevalence of depression/anxiety among a sample of people attending PR clinics in Victoria?
3. Do people who drop out of PR as it is practised in Victoria, Australia, have higher anxiety or depression scores as measured by the HADS, than people who complete their course of rehabilitation?

### Methodology

We conducted a large cross-sectional, multi-centre study in the state of Victoria, Australia, to address the research questions above. To answer research question (i), qualitative telephone interviews were conducted with PR coordinators to explain programs offered, management of depression/anxiety and awareness of local treatment guidelines of COPD-X20 and local hospital admission prevention guidelines (Hospital Admission Risk Program guidelines). Clinic coordinators were invited to participate in the study via email and telephone or face-to-face followup. Of 61 clinics in the state of Victoria, 44 were invited and 22 agreed to participate in the study (50% response rate). Clinics whose ethics procedures were too expensive or outside the time frame of the study were not included in the study. The telephone interview covered the following topics: reach of the program (number of patients), components of the program, use of depression and anxiety guidelines, screening tools used, and referral pathways.

To answer research question (ii), a total of 294 questionnaires were distributed to patients of the 22 PR clinics by clinic coordinators. This was a purposive sample (a non-random sample selected for a specific purpose) of people (both male and female aged 18 years of age and above) attending PR following a diagnosis of COPD in Victorian PR clinics, within a specified time frame, which depended on the length of program cycle run at each clinic. We were not able to select a random sample of all patients attending each clinic because of limitations of time and funding. Inclusion criteria were: diagnosis of COPD, over 18 years of age, assessed as eligible to attend PR. Because we were engaging third party recruitment ie coordinators distributed questionnaires on behalf of the research team, and because the number of patients attending PR during the survey period varied, the number of questionnaires distributed to each site varied from 6-25 per clinic. A total of 105 completed questionnaires were returned, with the response rate of questionnaires received from the 22 clinics ranging from 0-90%, and an overall response rate of 36% achieved with third-party recruitment of patients.

The self-report questionnaire for patients covered the following domains: Social wellbeing -age, sex, marital status, living arrangements, social supports; Physical wellbeing - COPD history, severity (self-reported, single item indicating mild, moderate or severe), smoking history, exercise; Psychological wellbeing - HADS and Duke Social Support Index27 (DSSI) – (Social interaction component); Service use- PR clinic attendance. The HADS is not a clinical diagnostic tool, but does identify symptoms of anxiety and depression and is used to grade severity of symptoms using a well-established cutoff point25,26. Responses on the HADS questionnaire are ordinal, ranging from 0 to 3 for each item and 0 to 21 for each subscale score. HADS subscale scores for anxiety and depression were calculated by summing the scores for each of seven questions, giving a total possible score of 21 for each subscale. On the HADS, a low score for both subscales of depression and anxiety is considered to be less than seven, while scores of between eight and 10 are suggestive of case level disorder, and a score over 11 indicates significant disorder26 The scale can be administered by a health professional or completed as a self-report questionnaire by the patient.25

 To answer research question (iii), coordinators were contacted by the research team to provide information on whether respondents dropped out of rehabilitation early or continued with their treatment to the satisfaction of their health professional at two to four months post program. This information was then compared with patients’ depression and anxiety scores.

### RESULTS

*Description of the PR programs*

Most programs ran as stand-alone services belonging to a larger health organisation. All clinics had a multidisciplinary team attending to the patients at various stages throughout the program, however, the physiotherapist and allied health staff were mainly responsible for on-site running of the program. Although the overall rehab program resulted from multidisciplinary contributions, the physiotherapist usually worked alone in providing the exercise component. The numbers of patients attending each program varied from 5-15 (average n=8) depending on client compliance and attendance since initial assessment to enter the program. Most (n=12) PR programs were run on an ongoing (continuous) basis while six clinics ran intermittent programs (1-4 programs per year). Program sessions varied from once weekly for 8 – 12 weeks to twice weekly for 6 – 10 weeks.

On average, patients attended 12 program sessions based on a twice-weekly, six-week program cycle.

*Components of the programs*

All programs (100%, n=22) included an exercise component and an education component, and most but not all clinics included psychosocial or psychological support to varying degrees.

Table xx shows the amount of psychological and psychosocial support offered in the clinics. Over one third of clinics (36%) did not offer any psychological support to patients. In the remainder, 23% (n=5) offered formal psychological support from specialist staff while the majority (63%) offered informal psychological support.

Insert Table 1 about here

Ten clinics referred their patients to patient support groups, and eight clinics had no links to any patient support groups. Although there was a general preference by coordinators to establish support groups, factors such as varied literacy levels of patients, diverse ethnicities, and poor patient compliance acted as barriers hindering this type of support being available.

*Use of Depression and Anxiety guidelines/screening tools/referral pathways*

When clinic coordinators were asked about guidelines for management of mood in their patients, 32% (7/22) were not aware of COPD-X guidelines on assessment, treatment or management of mood disorders. The majority of coordinators, however, were aware of these guidelines and found them to be either useful or very useful in terms of applicability to the rehab program. Twenty-three percent of coordinators found the guidelines to be very useful in forming the framework/structure of the rehab program and how the rehab program operates broadly. One coordinator, in particular, stated that the recent update of these guidelines prompted a revision of its pulmonary rehab program, and another stated that these guidelines were used when in annual reviews. A third coordinator stated that the HARP and COPD-X guidelines ensured uniformity and similarity in approach. In addition to these guidelines, one rehab clinic also referred to US Pulmonary Best Practice guidelines although none referred to the UK guidelines.

Despite a substantial proportion of clinics not providing formal psychological support for their patients, most used screening tools or broader psychosocial tools measure quality of life, which to some extent contained emotional or psychological indicators of wellbeing. All except four clinics either used some specific mood disorder tool, a broader tool or informal methods to screen for depression and anxiety amongst their patients. Tools used included the Chronic Respiratory Disease Questionnaire (CRDQ), Quality of Life questionnaire, RAND-36 Health-related Quality of Life (HRQoL) survey, Short Form (SF-36) health survey, GUYATT quality of life tool, St George’s Respiratory Questionnaire (SGRQ) and Depression Anxiety Stress Scales (DASS-21) and the HADS. Overall, depression and anxiety screening tools were considered useful at all clinics participating in this study with requests for recommendation of suitable screening tools, but many clinics did not use tools that were specifically measuring depression and anxiety. Some of the issues raised in relation to screening tools included that the HADS was not particularly useful due to it being non-specific to respiratory diseases.

When questioned about what paths were used to refer patients with depressive symptoms if they were recognised, most clinics either used formal or informal referral paths and processes to manage patients with depressive symptoms.

These referral paths included referral to Community Health Services (eg, counsellor, social worker, dietician, client’s GP, etc) or to the counsellor or psychologist within the organisation, and providing information regarding services such as beyondblue (a community organisation specialising in anxiety and depression). In instances where the client had a Mental Health Care Plan, this was taken into account in responding to a perceived need to refer and this referral was likely to be to the primary care physician. Often clinics used the Care Assessment Tool (CAT), which identifies referral pathways for risk factors when the client is initially assessed to enter a rehab program. In some clinics, all health professionals in the multidisciplinary rehab team, including the client’s referring doctor, were involved in the referral process to a psychologist. Referrals to psychological care and support were made through the social worker or welfare or other health network structures. Usually the respiratory physician or the counsellor was involved in referring, with contribution, although to a lesser extent, by the client’s primary care physician.

Three clinics followed informal referral mechanisms when psychological concerns in patients were identified. This was due to inadequate program (organisational) structure and lack of means (ie lack of training to identify and deal with patients exhibiting mood disorders, lack of referral processes to implement, lack of assessment/screening tools) to manage patients with depressive symptoms. Two of these clinics were able to identify patients with depressive symptoms through this study, which enabled the patients to be referred on to further support.

However again 32% (n=7) clinics did not have a process for managing depression. Reasons for not using any referral pathways included lack of an on-site psychologist and no responsibility for cases where the patient already had a doctor managing their mental health.

In summary, while the majority of clinics surveyed had some awareness of local guidelines to manage anxiety and depression associated with COPD, approximately one third of clinics lacked formal mechanisms for detecting mood disorders, adequate staffing to manage symptoms or adequate referral pathways.

# ***Patient sample results***

# In this context, we attempted to determine the prevalence of anxiety and depression symptoms in patients from the sample of PR clinics. We received questionnaires from 105 patients, and all questionnaires were completed fully. We found that of the sample of 105 patients surveyed in these 22 clinics, 43% were male and 57% were female. The mean age was 70.9 years (SD=8.3, range=52-90). Approximately one third (31%) lived alone. The mean DSSI score was 8.0 (SD=1.6). When patients were asked to self-rate their COPD symptoms, 20.2% rated them as mild, 67.7% rated them as moderate and 12.1% rated their symptoms as severe. Therefore, the majority of these patients were experiencing moderate to severe COPD symptoms. Most patients (71.6%) were previous smokers. In this sample, the mean depression score from the HADS was 5.0 (SD=3.0, range=0-13) and the mean anxiety score was 5.5 (SD=3.4, range=0-18). Therefore, the mean depression and anxiety scores were within the normal range. However, the range of scores indicated that a number of patients were experiencing concerning symptoms of depression and/or anxiety. When we analysed scores that were suggestive of case level depression, we found that overall, 20.4% of patients reported depression and 27.2% of patients reported suggestive or case level anxiety. However these patients were not clustered within clinics that had no formal psychological supports.

Correlating social network scores with depression and anxiety, there was a negative, but non-significant, correlation, ie people with lower social network scores tended to have higher depression scores, although the relationship was not significant. In addition, there was no evidence of a link between depression or anxiety symptom scores and compliance with programs. We found only three patients of the 105 surveyed who did not complete the program of PR (one client with high depression/anxiety, two without) therefore there were insufficient numbers to calculate any statistical relationship between completion of PR and HADS subscale scores.

### DISCUSSION

While awareness is growing of the importance of being aware of mood disorders and their impact on COPD, we found that there is still some way to go in integrating psychological and psychosocial support into PR programs in Victoria, Australia. Awareness of management guidelines for depression and anxiety in COPD patients was variable across the clinics recruited into our study. While some clinics were well connected into psychological and psychosocial supports for the region, other clinics had very limited access to psychological support for their patients and no links to patient support groups. Our study showed that while PR clinics pay some attention to psychological wellbeing of patients, there was only moderate use and awareness of current guidelines for management of depression and anxiety. Results of the client survey indicated that while the overall mean depression and anxiety scores were within the normal range, there were a fair proportion of patients with suggestive or case level disorder, although it was not related to compliance with the course of rehabilitation. Study results of the prevalence of depression in hospital samples have been very variable, so that the prevalence found in the present study was in the middle of the range of previous prevalence studies.3,5,10,11

The main goals of COPD management are to lessen airflow limitation, prevent and decrease symptoms, prevent and treat medical complications and improve daily living and quality of life.22 Mood disorders can have a direct effect on the likelihood of meeting these goals, and depression has been associated with poorer outcomes in patients with COPD 15. Unlike previous studies, we found no link between compliance with rehabilitation and depression. However, our respondents may have been the most motivated ones to maintain their program among PR patients, and in light of limited rehabilitation resources, patients for rehabilitation are carefully selected to ensure that they can cope with the program, so patients with higher levels of depression or anxiety may avoid rehabilitation or be referred elsewhere, and patients with higher depression or anxiety who were accepted into rehabilitation may have been less likely to participate in our survey. The limitations of the study were that the 22 clinics that responded to the invitation to participate may not have been representative of the other clinics in the state. The range of clinics covered large government funded sites as well as smaller community sites, and rural, regional and urban settings. The small sample of patients surveyed may not have been representative of all patients attending PR. Self-rated COPD severity was not externally validated with standardised measures such as FEV1 or FEV/FVC. Finally, we were not able to determine whether patients with case level anxiety or depression had any previous or current pharmacological or non-pharmacological treatments as these data were not collected for individuals.

### CONCLUSION

Given the importance of providing psychological and psychosocial support for COPD patients in order to maximise the effect of rehabilitation on quality of life22 future research needs to investigate alternative models of support to supplement the exercise and education that is currently offered routinely by all PR clinics studied here. Some studies have reported that CBT can be helpful for COPD patients.2 Future research is needed to investigate efficient ways to provide psychological and psychosocial support as part of PR, as well as at other stages in the pathway of management of the disease.

Acknowledgement: This research project was funded by Beyondblue Research Grant 08DOY1

*beyondblue: the national depression initiative. Details of human research ethics approvals obtained for the study are available on request.*

Conflicts of interest: none.

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| Table 1: Types of psychological support offered in sample of pulmonary rehabilitation clinics (categories are not mutually exclusive) |
| Type of psychological support | Percent of clinics (N=22) |  |
| Formal | 23% (n=5) |  |
| Informal |  |  |
| Psycho-education | 14% (n=3) |  |
| Social worker/counselor | 27% (n=6) |  |
| Support group | 9% (n=2) |  |
| Debrief only  | 4% (n=1) |  |
| None | 36% (n=8) |  |
|  |  |  |